

MWI 8730.2

REVISION E

EFFECTIVE DATE: October 20, 2016

EXPIRATION DATE: October 20, 2021

MARSHALL WORK INSTRUCTION

QD01

TEMPORARILY- INSTALLED HARDWARE CONTROL

COMPLIANCE IS MANDATORY

DIRECTIVE IS UNCONTROLLED WHEN PRINTED

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Change/ Revalidation/ Canceled)	Document Revision/ Change	Effective Date	Description
Baseline		5/14/99	Document converted from MSFC-P10.1-CO3 to a Directive. Previous history retained in system as part of canceled or superseded ISO Document files.
Revision	A	8/18/99	Updated document to reflect new MSFC reorganization.
Revision	B	1/16/02	Correct typographical errors on pages 4 and 6. Delete reference to previous version of red streamer tag and update the reference S&MA organization to contact to obtain the current MSFC TAG 16 in Appendix B on page 10.
Revision	C	9/30/2004	Update font and letter size to Times New Roman, 12. Use shall for all mandatory requirements per HQ Rules Review Action. Change QS to QD. Change MPG's to MPR's. Clarify Applicability statement and Definitions by adding supporting text. Identify actions to Performing Organization and S&MA in paragraphs 6.2 to 6.4. Use "temporarily-installed hardware" consistently. Clarify roles in Appendix A.
Revision	D	7/12/2007	Added missing applicable document to paragraph 3. Made minor editorial changes including modifying the sentence structure in paragraph 1 and added sub-paragraphs to paragraphs 2, 6.2, 6.3, 6.4 and Appendix A. Added MWI to 2.1 and 2.2. Added "Safety and Mission Assurance" beside S&MA in 5.1 to clarify the abbreviation. Added the word "red" to 6.2.2. Capitalized Red Streamer in paragraph 6.4.5. Added "start" and "end" blocks to the flow diagram in paragraph 11 and changed the font to Times New Roman. Corrected the date of the cancellation document in paragraph 12. Changed indentions on Appendix A spacing and made minor editorial changes. Added the word "red" to B.1 in Appendix B and referred to the sample on the following page in B.2. Added a title to the Sample Red Streamer (MSFC Tag 16) above the illustration in Appendix B and deleted the note below the illustration.
Revision	E	7/07/2010	Revise Applicability Statement. Minor editorial changes throughout. Separate multiple shall statements. Re-number paragraphs throughout. In 6.3.3, document that QA retains a duplicate copy of the open TIR in the Quality Records Center in the event of loss of the original record. In 6.3.4, add verbiage to attach open TIR record to the data package, part tag, or equipment logbook to accompany hardware flow. Change flowchart to Times New Roman size 12. Update paragraph numbers in flowchart. Change Appendix A and B to Chapter 1 and 2 and change associated reference in 6.2.1. Added step 6.4.7. Add NPR 1441.1 to Applicable Documents. Show TIR abbreviation in 6.2 and use abbreviation in 6.2.1 and the flow chart. Add reference to MPR 8730.1 in 6.3.2. Add NRRS schedule to Records section in 9.2 and 9.3. Clarify alpha numeric listing for multiple red streamers listed on the TIR form in CH1.2. and CH2.1. Add step 10 to CH1.3.
Change	1	12/30/2014	On 12/30/14, at the request of the OPRD, an administrative change was made to update the title of MPD 1280.1 throughout the directive.
Revalidation	E	10/20/2016	Re-formatted to comply with new required template per MPR 1410.2 & as instructed in MWI 1410.1. No changes were made to technical content. Replaced S&MA with SMA. (Revalidation includes Change 1 dated 12/30/2014.) Deleted Flow Diagram

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1. PURPOSE

The purpose of this MWI is to meet the requirements of MPD 1280.10 for inspection and test to provide traceability in defining requirements for in-house control of temporarily-installed hardware items in flight and flight-associated systems, and the subsequent preflight removal of those items.

2. APPLICABILITY

2.1 This MWI applies to Center personnel, programs, projects, and activities, including contractors and resident agencies to the extent specified in their respective contracts or agreements. (“Contractors” for purposes of this paragraph, include contractors, grantees, Cooperative Agreement recipients, Space Act Agreement partners, or other agreement parties.)

2.2 This MWI applies to the Michoud Assembly Facility.

2.3 This MWI applies the following: all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms: “may” or “can” denote discretionary privilege or permission, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.

2.4 This MWI applies the following: all document citations are assumed to be the latest version unless otherwise noted.

2.5 This MWI applies to all personnel responsible for installing or removing temporarily-installed hardware defined by engineering documentation with stipulations for pre-flight removal.

2.6 This MWI applies in cases where engineering documentation invokes temporarily-installed hardware prior to, or subsequent to, final assembly.

2.7 This MWI applies to implementation at final assembly of flight articles at MSFC or upon receipt from contractors and maintained at all times while the hardware is within MSFC.

3. AUTHORITY

MPD 1280.10, “MSFC Quality Management System Policy”

4. APPLICABLE DOCUMENTS AND FORMS

4.1 NRRS 1441.1, “NASA Records Retention Schedules”

4.2 MPR 8730.1, “Inspection and Testing”

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4.3 MPR 8730.3, “Control of Nonconforming Product”

4.4 MSFC Form 4340, Temporary Installation Record

4.5 MSFC Tag 16, Remove Before Flight Tag

4.6 MSFC Tag 312, Parts Tag

5. INSTRUCTIONS

5.1 Authority.

5.1.1 The performing organization shall authorize all items to be temporarily installed on a work authorizing document (i.e., Test Preparation Sheet [TPS], Work Order, Discrepancy Record [DR]).

5.1.2 All items to be temporarily installed shall be specifically identified on the work-authorizing document (WAD).

5.2 Temporary Installation Record (TIR) Initiation and Tagging.

5.2.1 As defined on the WAD, the performing organization shall initiate a TIR, MSFC Form 4340 (appendix E), and attach a serialized red streamer(s) (appendix F), to the temporarily-installed hardware after its installation.

5.2.2 Where possible, the red streamer shall be tied to the hardware and taped.

5.2.3 If it is impractical to tie the red streamer, both ends shall be taped.

5.2.4 The tape used shall be compatible with the surface of the item taped.

5.2.5 When the attachment of a red streamer to an item could be detrimental to its function or because of the size or the location of the item is not feasible, the red streamer shall be attached in close proximity to the installed item.

5.3 Documentation.

5.3.1 The performing organization shall ensure that the applicable WAD is not closed until the associated TIR entries are completed.

5.3.2 SMA Safety Mission Assurance shall monitor all TIR entries to determine when they are complete in accordance with MPR 8730.1.

5.3.3 SMA shall maintain a duplicate copy of the open TIR in the Quality Records Center (to assure tracking in the event of loss of the TIR form) until the TIR is closed out or delegated to another entity for closeout.

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5.3.4 The performing organization and SMA shall stamp and/or sign and date the TIR to signify that the document is acceptable to close and file in the final assembly data package or attach to the MSFC Tag 312, Part Tag, or Equipment Logbook for the end item.

5.3.5 If the temporarily-installed hardware item is to be shipped with the final assembly from MSFC, the performing organization shall note this information on the TIR, ensure that the data package includes a copy of the TIR, ensure the data package index identifies the TIR, and ensure the red streamer(s) remains attached to the hardware as shipped.

5.3.6 Further follow-up action to locate or have the red streamer returned shall not be necessary unless removal is to be performed by MSFC personnel at a remote location prior to turnover for flight.

5.4 TIR and Red Streamer Maintenance.

5.4.1 The performing organizations and SMA shall maintain an up-to-date status of open TIRs in the data package.

5.4.2 Performing and monitoring SMA personnel shall stamp and/or sign the appropriate blocks when all work is complete.

5.4.3 If this closeout function is to be performed at another location other than by MSFC personnel, the process shall be delegated to the applicable organization.

5.4.4 The performing organization and SMA shall verify accountability of the total number of red streamers supplied to each final assembly.

5.4.5 If a red streamer is unaccounted for, a review of the documentation and hardware shall be made to certify that the non-flight hardware identified by the red streamer is not installed.

5.4.5.1 If the temporarily-installed hardware is still required to be installed, SMA shall initiate a DR in accordance with MPR 8730.3.

5.4.5.2 The DR shall document the search for the missing red streamer documenting the cause for its loss and its subsequent acceptable replacement prior to closure.

5.4.6 Lost Red Streamers shall be replaced with new ones serialized using the next sequential number.

5.4.7 When all temporarily-installed hardware has been removed and all red streamers have been removed, the removing organization and the SMA inspector initial or stamp and date the removal entries and close the TIR when the last entry is completed.

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6. CANCELLATION

MWI 8730.2E, Temporarily Installed Hardware Control, dated July 7, 2010.

Original signed by

Todd A. May
Director

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APPENDIX A

Definitions

Performing Organizations. Personnel responsible for installation and/or removal of temporarily-installed hardware and Safety and Mission Assurance (SMA) personnel responsible for verifying tracking and control procedures established herein.

Temporarily-installed hardware. The temporary installation of non-flight hardware prescribed by engineering documentation that is to be removed prior to flight or shipment as defined by engineering. Examples are: hardware that is not per drawing, protective devices, flight dummies for fit-up only, test or handling devices, or lens covers. This definition excludes protective connector or quick disconnect covers which are installed during in-process assembly and testing and subsequent removal is assured by further integration and testing at next higher assembly levels.

APPENDIX B

Acronyms

DR	Discrepancy Record
SMA	Safety Mission Assurance
S/N	Serial Number
P/N	Part Number
TIR	Temporary Installation Record
TPS	Test Preparation Sheet
WAD	Work Authorizing Document

APPENDIX C

(Reserved for Verification Matrix)

None

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APPENDIX D Records

D.1 The TIR (MSFC Form 4340) will be maintained by the project/test engineer maintaining control of the hardware as a record traveling with the hardware until all temporarily-installed hardware is removed.

D.2 Upon removal of all temporarily installed items and completion of entries on the MSFC Form 4340, closed TIRs will be routed to the Project Office/Data Manager and dispositioned as temporary records in accordance with NRRS Schedule 8 (exact retention to be determined by the Project Office/Data Manager).

D.3 The duplicate copy retained by SMA in the Quality Assurance Records Center per 5.3.3 can be discarded per NRRS 8/108 when the official copy is closed.

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APPENDIX E TEMPORARY INSTALLATION RECORD (TIR) INSTRUCTIONS

E.1 The TIR is a record for the accountability of temporarily-installed hardware that will be removed at a specified time, prior to flight or shipment.

E.2 The TIR form bearing the alpha-numeric serialization list for single or multiple red streamers will be located with the work authorizing document and, as applicable, the data package.

E.3 The TIR form will be initiated by the responsible organization and completed as follows:

Block

<u>Number</u>	<u>Entry Description</u>
---------------	--------------------------

1. Enter name, part number, and serial number of the final assembly.
2. Enter part name, part number, and serial number of the item to be installed.
3. Enter document name and number that authorized installation.
4. Enter red streamer serial number.
5. Installer enters name and date to signify completion of installation.
6. SMA stamps and dates, noting temporary installation when work is acceptable.
7. Enter document name and number that authorized removal.
8. Remover enters name and date to signify removal of temporary installation.
9. SMA stamps and dates indicating temporary installation removal.
10. Repeat 1-9 on the TIR form for each serialized red streamer with a horizontal line separating each red streamer entry.

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RED STREAMER INSTRUCTIONS AND TAG

F.1 Each red streamer (MSFC Tag 16) will be serialized prior to installation using a permanent marker, color black and listed in alpha-numeric order on the applicable TIR form.

F.2 Serial numbers will be alpha-numeric starting with A001 for each final assembly element tagged with streamers noting temporary hardware installation.

F.3 When multiple assemblies are tagged and are located adjacent to each other, or are in the general area, the first character of the serial numbers used for each assembly will have different alphabetic letters starting with A, continuing with B, C, etc., as required.

F.4 Streamers will be red in color, with black print, weather resistant, flexible, with approximate dimensions of 2 inches wide by 12 inches long. (See sample following page)

F.5 Performing organizations will contact the assigned SMA inspection team representative to obtain red streamers (MSFC Tag 16).

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SAMPLE RED STREAMER (MSFC Tag 16)

○

REMOVE

BEFORE FLIGHT

SERIAL NUMBER

MSFC-Tag-16 (February 1998)